

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Scott Sibbett

Application No.: 10/814,979

Confirmation No.: 8637

Filed: March 30, 2004

Art Unit: 1753

For: COUNTER ELECTROSEPARATION DEVICE
WITH INTEGRAL PUMP AND SIDEARMS
FOR IMPROVED CONTROL AND
SEPARATION

Examiner: A. S. Noguerola

SECOND PRELIMINARY AMENDMENT

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant would like to thank Examiner Noguerola for his comments and suggestions in the telephone interview held June 16, 2008. In the interview, the operation of the device illustrated in Figure 4 of the specification was discussed. Applicant explained that the microchannels of the device have charged walls (stationary charges) which attract ions/charged molecules in solution. In one mode of operation, a potential is established between an electrode in reservoir 114 and an electrode in reservoir 116. Due to this potential, charged molecules flow (dragging fluid) from reservoir 114 through microchannel 120, through microchannel 122, to reservoir 116. If microchannel 122 is coated with a coating that suppresses electroosmosis, there will be a positive pressure at the "T" junction 124 which results in some fluid flowing toward reservoir 112. That is, in this embodiment, convective flow is generated toward reservoir 112. As discussed, coating the microchannel 122 is equivalent to a system of pipes in which "pipe" 122 is more narrow than "pipe"

120. Under pressure, excess fluid will flow toward reservoir 112. In further explanation of the operation of the electroosmotic pump, Applicant downloaded and emailed the Examiner three references: (1) Linnea et al., Microchip countercurrent Electro separation, (2) Dimiter, et al., Microchannel Protein Separation by Electric Gradient Focusing, and (3) Ramsey, et al., generating Electrospray from Microchip Devices Using Electroosmotic Pumping. Copies of these references are submitted herewith with an IDS. The charged molecules can be focused in the channel by applying different potentials at “++” and “+++” in Figure 4.

Applicant also notes, consistent with the explanation in paragraphs [0024] and [0025], in a second mode a negative potential can be generated at the “T.” In this embodiment, microchannel 120 is coated with an electroosmotic suppressant. As in the above embodiment, a potential is setup between reservoirs 114 and 116 drawing fluid from reservoir 114 to reservoir 116. In this embodiment, flow in “pipe” 122 is greater than flow in “pipe” 114. Thus, the fluid “drains” into reservoir 116 faster than it can be supplied from reservoir 114. Therefore, there is an induced convective fluid flow from reservoir 112 through “pipe” 118 toward reservoir 116. Basically, the negative pressure at “T” 124 sucks fluid from reservoir 112 toward reservoir 116.

Dated: June 18, 2008

Respectfully submitted,

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